



THE UNIVERSITY OF BRITISH COLUMBIA
Faculty of Land and Food Systems

2026 GRADUATE STUDENT CONFERENCE

Organized by LFS Graduate Student Council

OFFICIAL PROGRAM

March 5th, 2026 (Thu)
9:00 am - 4:00 pm
Thea's Lounge



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SCHEDULE

AM

9:00 – 9:30 AM

Registration

9:30 – 9:40 AM

Opening Remarks

9:45 – 10:45 AM

Oral Presentations

Session 1

Stretch break - 10 min

10:55 – 11:55 AM

Oral Presentations

Session 2

Lunch break - 35 min

PM

12:30 – 1:30 PM

Poster Session

1:30 – 2:30 PM

Oral Presentations

Session 3

Stretch break - 10 min

2:40 – 3:40 PM

Oral Presentations

Session 4

3:40 – 4:00 PM

**Awards Announcement
& Closing Remarks**

End of conference

MESSAGE FROM THE DEAN



It gives me great pleasure to welcome you to the 12th LFS Graduate Student Conference, organized by the LFS Graduate Student Council, an annual event that brings together the diverse areas of research in our faculty.

As Dean pro tem, I am extremely proud of the high calibre of research taking place in LFS. This is an opportunity for us to come together and share in the academic achievements of our LFS student researchers as they support our Faculty vision "balancing our food systems and planetary health to create a better world." The research presented at the conference will address both local and global issues that involve the entire food system - "from farm to fork":

- Addressing climate change and resilient food systems
- Ending hunger and improving food security
- Enhancing regional agriculture for sustainable cities
- Promoting nutrition and wellbeing for healthier communities
- Ensuring the health and welfare of animals in society

LFS is indebted to our student researchers for their efforts that collectively yield important discoveries towards a sustainable food system, within the confines of preserving our climate, and its complex ecosystems.

You will be informed at this conference on many interesting research outcomes that span from farm to fork. Examples include advances in securing food sustainability in distinct agricultural domains; modernizations in animal welfare practices; innovations in food processing in order to improve its nutritional quality and safety; and, solutions that impact important areas of food resource economics, policy, human health and wellness.

These research topics and the presentations today will provide you with a wealth of information. This is an important opportunity to share ideas and discussions with fellow researchers that could lead to new directions, or exciting synergistic collaborations. This conference plays an important role in enabling our Faculty to build bridges across all disciplines, researchers and laboratories.

Please look forward to a wonderful day of knowledge exchange, showcasing the achievements of our graduate and undergraduate students.

Warmest regards,

Dr. David Kitts

Professor and Dean pro tem
Faculty of Land and Food Systems

MESSAGE FROM THE COORDINATORS

Dear conference attendees,

As a council of graduate students, we are thrilled to bring together students from across the Faculty of Land and Food Systems to share knowledge, inspire new ideas, and foster academic connections. This year's council has worked hard to create a program that reflects the diversity and excellence of LFS scholars.

We encourage you to take full advantage of the Q&A sessions during oral presentations, the poster session, and the many opportunities for socialization in between. Ask questions, share insights, and connect with fellow attendees—this conference is shaped by your engagement!

This event would not be possible without the support of our faculty, keynote speaker, sponsors, and attendees. We extend our heartfelt thanks to all who contributed their time, expertise, and enthusiasm.

Your participation is what makes this conference a success. We hope you find the conference both insightful and inspiring!

Sincerely,

The 2025-2026 LFS Graduate Student Council

ORAL PRESENTATIONS (AM)

SESSION 1

9:45-10:00

Association of Vitamin B-12 Intake and Biomarker Concentrations with the Consumption of Growing-Up Milk, Cow's Milk, or No Intervention, in 24-Month-Old Toddlers: Results from A Dietary Intervention Trial

Adrianna Greco

10:00-10:15

Salt Intake Knowledge and Behaviour Among Students of Federal University of Agriculture, Abeokuta, Nigeria

Ayomide Ademola

10:15-10:30

Huts as a Refined Handling Method for Laboratory Mice

Maya Bodnar

10:30-10:45

Examining the Relationship between Parental Eating Behaviours and Parental Feeding Practices and Styles: A Systematic Review

Celeste Bouchaud

SESSION 2

10:55-11:10

Soil Legacies of Indigenous Cultivation and Landscape Multi-Functionality in Xsi Madii Lii

Alyssa Robinson

11:10-11:25

Microbiome-Derived Metabolites of Phytoestrogens as Potent Epigenetic Modulators of the Immune and Inflammatory Functions in Prostate Epithelial Cells

Arian Abolhassani

11:25-11:40

Early-Life Nutrition Instructs ILC3 Development in Dairy Calves Through Microbiota-Driven Metabolic and Epithelial Signals

Chengxi Xu

11:40-11:55

Canada's Food Guide Adherence and Health Impacts: Insights from a Target-trial Emulation with an Equity Lens

Saba Jalali

ORAL PRESENTATIONS (PM)

SESSION 3

- | | |
|------------------|--|
| 1:30-1:45 | Perceived Importance of Dairy Cow Housing Attributes Among The American Public
Amalia Urloiu |
| 1:45-2:00 | Soil Development Stage Shapes Shoot-To-Soil Carbon Flow and Organo-Mineral Association Under Variable Phosphorus Supply
Sasha Pollet |
| 2:00-2:15 | Why Some Food Proteins Stay Stable: Rules for Processing Robustness and Digestibility
Andrew Sanders |
| 2:15-2:30 | A High Prevalence of Iron Deficiency in Pregnant Individuals in Vancouver, Canada: Inadequate Iron Intakes or Diagnostic Inaccuracy of Ferritin Thresholds to Define Iron Status?
Lulu Pei |

SESSION 4

- | | |
|------------------|---|
| 2:40-2:55 | Bridging Climate Knowledge Gaps for Resilient Farming Systems in Nigeria
Maryjane Onyechesi |
| 2:55-3:10 | Louvain-Derived Dietary Communities and Their Associations with All-Cause Mortality and CVD Risk in Canadian Adults
Yifei Wang |
| 3:10-3:25 | Trapping and Detecting of Emerging Contaminant PFAS Using Novel Metal-Phenolic Networks-Enabled SERS Techniques
Haoming Yang |
| 3:25-3:40 | From Seizure to Shelter: The Impact of Cruelty Cases on Animal Protection Officers' and Animal Shelter Workers' Mental Wellbeing
Meghan Lok |

POSTER PRESENTATIONS

12:30 - 1:30 PM

1

The Bridge from Human to Animal Welfare
Asmi Aggarwal

2

Understanding the Motivations of Feral Rabbit Feeding in British Columbia
Tanesha Chakraborti

3

Correlation Between the Number of Ovulations and the Number of Estrous Events Detected by an Automated Activity Monitor in Lactating Holstein Cows
Natalie Der

4

Role of the N-terminal Domain in CsgA Amyloid Assembly
Amalia Diaz de Leon Derby

5

Dietary Leucine Requirements During Early and Late Gestation in Healthy Pregnant Women
Layan El Rifai

6

Habitual Energy and Protein Intakes in Male and Female Masters Athletes: A Multilevel Meta-Analysis
Mingyang Fan

7

PREconception Folic Acid Clinical Efficacy (PREFACE) Trial
Colleen Farrell

8

Capturing (Dis)Placed Filipino Foodways on Coast Salish Lands
Desiree Anne Ramos Gabriel

POSTER PRESENTATIONS

12:30 - 1:30 PM

9

Tailored Deep Learning-Assisted In Situ SERS: Overcoming Surface Irregularities-Induced Large Signal Variation on Biological Tissues

Ling Guo

10

Molecular Effects of Polyphenols from Different Kombucha Fermentation Products in HepG2 Liver Cells

Gloria-Renate Klein

11

Udder Health: Associating Automated Measurements with Mastitis Events in Lactating Holstein Cows

Nina Kosikova

12

Protein Requirements in Highly Active Older Adults and the Influence of Exercise

Rebecca (Becca) Ladouceur

13

Perinatal Lifestyle Interventions for Managing Postpartum Weight and Glucose Outcomes: A Systematic Review and Meta-Analysis

Yinan Lang

14

Methylotrophic Methanogenesis in the Rumen: The Role of Pectin Metabolism during 3-NOP Supplementation in Cattle

Maya Lee

15

Formulation of Broad-Spectrum Bacteriophage Cocktails for Controlling Poultry-Associated Salmonella Enteritidis

Lanyin Li

16

Adolescents' Perspectives and Experiences with Dietary Mobile Health Apps: A Scoping Review

Maria Magro

POSTER PRESENTATIONS

12:30 - 1:30 PM

17 Leveraging Decision Support Systems for Agroecology in Ekiti State, Nigeria
Oluwaseun Makanjuola

18 Micronutrient Deficiencies among Pregnant Individuals in Cambodia: Prevalence Rates and Trends Across Trimesters
Stella Mlewa-Mapemba

19 Revitalizing Forest Gardens in Laxyuubm Ts'msyen: Historical Indigenous Land-Use for Contemporary Soil Resilience
Kristen Pundyk

20 Antimicrobial Peptide Residue Detection in Chicken Breast Muscle Tissue
Xiyuan Shang

21 Effects of Dietary Pterostilbene on Subcellular Distribution of Metabolites Involved in Epigenetic Regulation in Liver Tissue
Megan Truong

22 Assessing Knowledge of Evidence-Based Dog Training Among Pet Care Professionals in Greater Vancouver
Nicole Vile

ABSTRACTS

ORAL PRESENTATIONS



ORAL PRESENTATION - SESSION 1

Association of Vitamin B-12 Intake and Biomarker Concentrations with the Consumption of Growing-Up Milk, Cow's Milk, or No Intervention, in 24-Month-Old Toddlers: Results from A Dietary Intervention Trial

Adrianna Greco (1,2), Sarah Montgomery (1,2), Niklas Tappauf (1,2), Jeffrey N. Bone (2), Tim F. Oberlander (2,3), Yvonne Lamers (1,2)

1. Food, Nutrition and Health Program, Faculty of Land and Food Systems, The University of British Columbia, Vancouver BC V6T 1Z4, Canada

2. British Columbia Children's Hospital Research Institute, Provincial Health Services Authority, Vancouver BC V5Z 4H4, Canada

3. Department of Pediatrics, Faculty of Medicine, The University of British Columbia, Vancouver BC V6H 3V4, Canada

Vitamin B-12 (B-12) is essential for early life growth and neurodevelopment, and B-12 status may differ based on feeding practices. We examined the association between growing-up milk (GUM;500 mL/day), cow's milk (COW;500 mL/day), and no intervention (POP) on B-12 intake and biomarker status in 24-month-old Canadian toddlers in a 6-month dietary intervention trial (NCT03038854;n=409). Dietary intake data was assessed with parent-reported 5-day food records. Biomarkers included serum total B-12 and methylmalonic acid (MMA). Linear regression models were conducted in full analysis set (FAS) and per-protocol (PP) populations, adjusted for baseline values and sex (model 1), and additionally for breastfeeding duration and maternal education (model 2). <3% of toddlers had B-12 intakes below the Recommended Daily Allowance (0.9µg/day). Endline B-12 intake was higher in GUM versus POP (Beta-coefficient: 0.458µg/day, p-value=0.025), and COW versus POP (0.490µg/day, p-value=0.007) in FAS; GUM versus POP was not statistically significant in PP and no group differences observed using energy-adjusted intakes. GUM had higher endline serum total B-12 than POP (81.2pmol/L, p-value=0.021) in FAS model 1; associations were attenuated in model 2 and in PP. No group differences were observed for MMA. B-12 intake was high among most toddlers and milk products are important dietary contributors.

This work is supported by the University of British Columbia and British Columbia Children's Hospital Research Institute, with funding from Société Des Produits Nestlé S.A. under a Research Agreement.

ORAL PRESENTATION - SESSION 1

Salt Intake Knowledge and Behaviour Among Students of Federal University of Agriculture, Abeokuta, Nigeria

Ademola, A.M (1,2), Onabanjo, O.O (1)

1. Nutrition and Dietetics Department, Federal University of Agriculture, Abeokuta, Nigeria.

2. Food Science, Faculty of Land and Food Systems, University of British Columbia, Vancouver, Canada.

An estimated 2.5 million deaths could be prevented each year if global salt consumption were reduced to the recommended level, less than 5g per day for an adult. Achieving the stated sodium and salt recommendations may be challenging for people, especially university students who rely on restaurant meals. This study assessed salt intake knowledge and behaviour among the students of the Federal University of Agriculture, Abeokuta. Salt intake knowledge, perception, behaviour, and body mass index (BMI) of 300 students who were randomly selected were assessed. Most respondents are between the ages of 21 and 30 years (75.7%), 66% have a BMI within the healthy range, while 14.7% and 5.7% are within the overweight and obese range, respectively. Most of the students (77.3%) know that there is a relationship between high salt consumption and hypertension. The study shows that 25% buy food from restaurants at least 3 days a week, 11.3% buys low salt alternatives, and about 20% of the participants indicated that they look at the salt/sodium content on food labels. This study showed that knowledge does not necessarily translate into practice. Further research is recommended to study the barriers to healthy salt and sodium consumption among university students.

Huts as a Refined Handling Method for Laboratory Mice

Maya J. Bodnar, I. Joanna Makowska, Catherine A. Schuppli, Daniel M. Weary

Animal Welfare Program, Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC V6T 1Z4, Canada

Laboratory mice are commonly handled by the tail despite evidence that this is aversive. Using cupped hands or tunnels to handle mice is associated with improved welfare, but tail handling persists due to barriers, including tunnel costs. Mouse huts are commonly included in cages and can be used for handling. We compared hut handling with tunnel handling and cupping on measures of anxiety and voluntary interaction with the handler. Mice were randomly assigned to a handling method (hut, tunnel, or cupping) that was applied daily for nine days. Hut-handled mice interacted the most with the handler, followed by tunnel-handled and cupped mice. Anxiety levels did not vary with treatment. In a second study, we assessed whether tail restraint during hut handling (to reduce the risk of escape from the hut) was less aversive than tail handling. Mice handled using a hut, with or without tail restraint, interacted more readily with the handler compared to those tail-handled. Tail-restrained hut handling produced intermediate anxiety responses compared to hut handling (the least response) and tail handling (the most response). We conclude that hut handling is a refined handling method and can be adapted for more fearful mice who would otherwise likely be tail-handled.

ORAL PRESENTATION - SESSION 1

Examining the Relationship between Parental Eating Behaviours and Parental Feeding Practices and Styles: A Systematic Review

Celeste C. Bouchaud (1,2), Pragti Varshney (1), Tamara R. Cohen (1,2)

1. Faculty of Land and Food Systems, Human Nutrition, the University of British Columbia

2. BC Children's Hospital Research Institute, Healthy Starts, BC Children's Hospital, Vancouver BC

Parental feeding practices and styles can have lasting impact on the development of eating behaviours in children. The objective of this systematic review is to explore how parent eating behaviours are associated with their feeding styles and practices. This review (PROSPERO: CRD42024602542) explores parental eating behaviours, and their link with parental feeding practices and styles. Searches were conducted in Medline, PubMed, Web of Science and PsycINFO. Observational studies or qualitative studies published in English between 2000 and 2025 were considered examining parents of children under 18 years old. Of 5,736 records screened, 41 articles were included in this review. Most articles included mainly or only mothers. Articles explored parental eating behaviours such as emotional overeating. Many articles found a correlation between parental emotional overeating and coercive parental feeding practices such as food restriction and pressure to eat. Parental food neophobia was also associated in some studies with pressure to eat. This review improves our understanding of how parental feeding practices are linked to parent's own eating behaviours to better support parents in feeding their children. Future work should investigate a wider range of parental eating behaviours and positive feeding practices with a focus on aiming for gender diversity in parents.

Soil Legacies of Indigenous Cultivation and Landscape Multi-Functionality in Xsi Madii Lii

Alyssa Jeanne Robinson (1), Jean-Thomas Cornelis (1), and Chelsey Geralda Armstrong (2)

1. University of British Columbia, Faculty of Land and Food Systems, Department of Soil Science, Vancouver, BC V6T 1Z4, Canada

2. Simon Fraser University, Historical-Ecological Research Lab, Department of Indigenous Studies, Burnaby, BC V5A 1S6, Canada

Indigenous peoples in Pacific Northwest actively managed their territories for millennia, yet scholars know little about the extent to which their management practices impacted contemporary forests. Recent research has shown that the legacies of historical peoples' active management of temperate forests can still be observed today in native plant foodsheds called "forest gardens" composed largely of deciduous fruit trees and shrubs, growing near archaeological village sites. Forest garden ecosystems and plant foods were historically actively managed through practices such as burning, transplanting, clearing, and fertilizing. Historical soil management may play a vital role in maintaining these landscapes; however, little is known about the properties and functioning of soil in forest gardens. Therefore, to sufficiently guide the revitalization of Indigenous forest garden stewardship, we have partnered with Wilp Luutkudziwuz to gain a deeper understanding of how ancestral practices in forest gardens have influenced changes in soil properties and functioning.

ORAL PRESENTATION - SESSION 2

Microbiome-Derived Metabolites of Phytoestrogens as Potent Epigenetic Modulators of the Immune and Inflammatory Functions in Prostate Epithelial Cells

Arian Abolhassani, Jiayi Zhang, Marco Tello-Palencia, and Barbara Stefanska

Food, Nutrition and Health Program, Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC V6T 1Z4, Canada

Effects of pinostilbene (PNS), identified as a major colonic metabolite of the phytoestrogen pterostilbene (PTS) are poorly understood despite novel mechanisms reported for its parent compound. Furthermore, the role of either PTS or PNS in maintaining cellular homeostasis of healthy rather than aberrant cells remain underexplored. Recent evidence indicates that phytoestrogens impact protein arginine methyltransferase 5 (PRMT5), an epigenetic enzyme crucial in prostate health. This study aimed to characterize PTS/PNS gene targets regulated by PRMT5. Human RWPE-1 prostate epithelial cells were treated with non-toxic dose of hydrogen peroxide (H₂O₂), followed by 4-day exposure to PTS/PNS. RNA-sequencing was performed to identify differentially expressed genes. PRMT5-regulated genes were identified by cross-analyzing RNA-seq with PRMT5-chromatin immunoprecipitation and transcriptomics of PRMT5-depleted prostate cells. PNS led to a profound transcriptome remodeling, reversing H₂O₂-mediated aberrations in 379 genes, while PTS only affected 79 genes (p-adjusted<0.05). PNS targets were functionally enriched with immune functions and inflammatory signaling. PRMT5 knockdown mimicked the impact of PNS on expression of 53 PNS targets (e.g., stress responsive GADD45B and SEMA6D), which suggests PRMT5-dependent regulation. Apart from novel gene targets crucial in prostate health, this study revealed that phytoestrogens' microbial metabolites alter transcription of PRMT5-regulated genes involved in immune and inflammatory functions.

Supported by NSERC Discovery granted to BS.

ORAL PRESENTATION - SESSION 2

Early-Life Nutrition Instructs ILC3 Development in Dairy Calves Through Microbiota-Driven Metabolic and Epithelial Signals

Chengxi Xu and Leluo Guan

Applied Animal Biology, Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC V6T 1Z4, Canada

Innate lymphoid cell (ILC) development is commonly viewed as largely genetically pre-programmed, with environmental inputs acting primarily on mature cell function. However, the neonatal period represents a critical developmental window during which nutritional and microbial cues may actively instruct ILC ontogeny. In dairy cattle, how early-life nutrition shapes mucosal ILC development remains poorly understood. Here, we examine how colostrum exposure and early microbial colonization influence ILC development in neonatal dairy calves. Using an integrated approach combining single-cell transcriptomics, immune phenotyping, and microbiota-informed metabolic analyses of calf intestinal tissues, we identify early nutritional states associated with divergent ILC developmental trajectories. Early colostrum intake is associated with enrichment of *Bifidobacterium* and microbial metabolic pathways linked to acetate and lactate production, alongside coordinated activation of epithelial transcriptional programs governing barrier integrity and immune signaling. These conditions coincide with a tissue-specific bias toward reinforced ILC3 transcriptional programs supporting epithelial defense and barrier immunity, while maintaining ILC2 states associated with tissue repair. In contrast, delayed or altered early nutritional exposure is associated with disrupted epithelial-ILC crosstalk and aberrant ILC transcriptional profiles. Collectively, these findings demonstrate that neonatal ILC development in dairy calves is environmentally instructed by early-life nutritional, microbial, and metabolic signals.

Funding Source: Supervisor research grant

ORAL PRESENTATION - SESSION 2

Canada's Food Guide Adherence and Health Impacts: Insights from a Target-trial Emulation with an Equity Lens

Saba Jalali (1), Xiao Hu (2), Boris Sobolev (2), Mahsa Jessri (1)

1. Food, Nutrition and Health Program, Faculty of Land and Food Systems, The University of British Columbia, Vancouver, British Columbia, Canada

2. Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute, The University of British Columbia, Canada

National dietary guidelines aim to improve population health, yet their causal impacts on mortality, life expectancy, and cardiovascular disease (CVD) remain uncertain. We emulated a target trial among 15,835 adults from the Canadian Community Health Survey–Nutrition 2004 linked to mortality and hospitalization records through 2017 to estimate effects of improving adherence to Canada's Food Guide (CFG-2019). Adherence was measured using the Healthy Eating Food Index-2019 (HEFI-2019). Using inverse-probability-weighted pooled logistic regression, we estimated counterfactual risks of all-cause mortality, life expectancy, and CVD under universal and equity-targeted strategies. A universal shift to optimal adherence reduced 5- year (RR 0.55; 95% CI 0.39–0.77) and 13-year mortality (RR 0.67; 95% CI 0.52–0.88), increasing life expectancy by 4.6–7.1 years. Targeting adults aged 45–80 with lower educational attainment achieved mortality reductions comparable to less intensive universal strategies; targeting low income showed benefits only within the targeted group. Neither universal nor equity-targeted strategies produced significant CVD reductions. In contrast, increasing fruit and vegetable intake to 38% of foods consumed was associated with a 48% lower 13-year CVD risk. Improving adherence reduce mortality and extend life expectancy, with targeted educational strategies offering equity-relevant benefits. Even modest fruit and vegetable increases showed CVD benefits.

Supported by Canadian Institutes of Health Research (CIHR) and Canada Research Chair Program

Perceived Importance of Dairy Cow Housing Attributes Among the American Public

Amalia Urloiu, Daniel Weary, Marina von Keyserlingk

Applied Animal Biology, Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC V6T 1Z4, Canada

Most dairy cows in the United States (US) live in year-round indoor housing compared to pasture-based housing systems. Conventional indoor housing systems may misalign with societal expectations for cow welfare, given strong public preferences for pasture-based housing driven by perceptions of greater naturalness and emotional wellbeing. This study investigated public perceptions on the importance of dairy cow housing attributes offered by indoor and outdoor systems through an online survey developed in Qualtrics and distributed to a census-matched sample of 1,009 US participants in Prime Panels. Ten housing attributes were selected, based on prevalent topics discussed by the public and farmers in prior qualitative literature: ability to graze, fresh air and sunshine, space to move and rest, life of ease and relaxation for cows, cow agency, cow sociality, lameness prevention, weather protection, efficient health monitoring, and hygiene and disease prevention. To understand the frames of reference behind public perceptions, values, convictions, and knowledge relevant to dairy farming and cow welfare were also investigated through a selection of validated scales and questionnaires adapted from previous survey studies. Latent class analysis identified subgroups among the public with differing prioritization of housing attributes, suggesting heterogeneity in public opinion on dairy cow housing.

ORAL PRESENTATION - SESSION 3

Soil Development Stage Shapes Shoot-To-Soil Carbon Flow and Organo-Mineral Association Under Variable Phosphorus Supply

Sasha Pollet* (1), Jean-Thomas Cornelis (1), Chaoqun Wang (1), Thorsten Knipfer (1), Cindy Prescott (2), Amir Ahkami (3), Vimal Kumar Balasubramanian (3), Sophie Lehmann (3), Tanya Winkler (3), Tamas Varga (3), Kylee Tate (3), Young-Mo Kim (4), Guillaume Lobet (5)

- 1. Faculty of Land and Food System, The University of British Columbia, Vancouver, British Columbia, Canada**
 - 2. Department of Forest and Conservation Sciences, Faculty of Forestry, The University of British Columbia, Vancouver, Canada**
 - 3. Environmental Molecular Sciences Laboratory, Earth and Biological Sciences Directorate, Pacific Northwest National Laboratory, Richland, WA 99352, United States**
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 - 5. Earth and Life Institute/Agronomy, Université Catholique de Louvain, Louvain, Belgium**
- *tel : 1-236-996-7726, E-mail : sashapol@student.ubc.ca**

Understanding plant-soil-microbe interactions is central to improving nutrient use efficiency and soil carbon (C) storage. Root exudates mediate nutrient acquisition, shape microbial communities, and influence organo-mineral associations, yet how soil development stage regulates exudation and C fate remains poorly understood.

We investigated how soil development stage affects plants, rhizosphere C release, microbial activity, and organo-mineral associations. *Lupinus albus* was grown for 30 days under three phosphorus (P) levels in three podzolic horizons representing contrasting development stages: quartz-rich Ae, Fe- and Al-oxide-rich Bh, and primary silicate-dominated BC. Plant-derived C transfer was traced using a ^{13}C -CO₂ pulse-labeling experiment, with Fe-oxide mesh bags to assess newly stabilized organo-mineral C.

Soil horizon strongly influenced plant P response, and the fate of root-derived C. Shoot biomass was highest and P-insensitive in BC, but lowest and P-responsive in Bh. While dissolved organic C in exudates was similar, metabolomic profiles, microbial biomass, enzyme activities, and ^{13}C recovery in rhizosphere varied markedly among horizons. Carbon stabilization on reactive Fe oxides peaked in Bh, followed by Ae and BC.

These results demonstrate that soil development stage closely controls plant P responses and rhizosphere C fate, highlighting the tight coupling of plants, microbes, and minerals in C stabilization.

Funding source: 'WBI.world' Wallonie-Bruxelles Internationale.

A portion of this research was performed under the Large-Scale Research program (proposal: <https://www.emsl.pnnl.gov/project/60372>) at the Environmental Molecular Sciences Laboratory, a Department of Energy (DOE) Office of Science User Facility sponsored by the Biological and Environmental Research (BER) program under Contract No. DE-AC05-76RL01830.

Why Some Food Proteins Stay Stable: Rules for Processing Robustness and Digestibility

Andrew D. Sanders (1), Rickey Y. Yada (2), Derek R. Dee (1)

1. Faculty of Land and Food Systems, University of British Columbia, Vancouver, British Columbia, V6T 1Z4, Canada

2. Faculty of Agricultural, Life and Environmental Sciences, University of Alberta, Edmonton, Alberta, T6G 1C9, Canada

Last year, Nobel Chemistry laureate David Baker argued that proteins can help “solve urgent challenges in medicine, technology, and sustainability.” Food strongly shapes all three, yet basic food protein research remains scarce (even when food-related enzymes comprise the majority of an estimated ~15 billion CAD annual market). A key bottleneck is the mechanistic understanding of how proteins fold, remain stable or digested, and fail under processing conditions they did not evolve for, including heat, acidity, and pressure. Here, precision fermentation produced a custom pepsinogen construct, the inactive precursor of the digestive enzyme pepsin. Using single-molecule optical tweezers, its folding and stability were measured in real time with sub-nanometer resolution and millisecond time steps across hours, revealing pathways and failures that are invisible to traditional ensemble assays. In parallel, protein stability theory and in silico predictors were benchmarked against a dataset of ~100,000 mutants, clarifying where design methods succeed and where they break down. Together, these results help translate food problems into new designs.

ORAL PRESENTATION - SESSION 3

A High Prevalence of Iron Deficiency in Pregnant Individuals in Vancouver, Canada: Inadequate Iron Intakes or Diagnostic Inaccuracy of Ferritin Thresholds to Define Iron Status?

Lulu X Pei (1,2), Tamara R Cohen (1,2), Jennifer A Hutcheon (2,3), Crystal D Karakochuk (1,2)

1. Food, Nutrition and Health, The University of British Columbia, Vancouver, BC, Canada

2. BC Children's Hospital and Women's Health Research Institutes, Vancouver, BC, Canada

3. Department of Obstetrics and Gynaecology, The University of British Columbia, Vancouver, BC, Canada

Iron requirements increase during pregnancy to support blood volume expansion and the growing fetus. Current Health Canada guidelines recommend all pregnant individuals to consume a daily supplement containing 16-20mg elemental iron. Our aim was to assess iron status among n=95 pregnant individuals enrolled in an ongoing clinical trial in Vancouver, BC. Mean (SD) age was 33.5 (4.0) years, 55% were primigravida, 56% were of Caucasian ethnicity, and 83% had total household income >\$100,000 CAD. Iron deficiency prevalence (based on ferritin <30 µg/L) was 11% (n=7/62), 64% (n=45/70), and 82% (n=32/39), in the first, second, and third trimesters, respectively, despite the majority of participants (89%) having consumed a daily supplement containing at least 24mg elemental iron. After adjusting for maternal age, ethnicity, gravidity, and total household income, a 1-week increase in gestational age was associated with a 1.8 [1.5-2.2] µg/L decrease in ferritin concentration, corresponding to a 20.8 [10.8-31.7] % increase in the odds of iron deficiency (p<0.001). The high prevalence of iron deficiency, despite daily supplementation, highlights a need for reassessment of iron dosage in current recommendations. Given the effects of hemodilution throughout pregnancy, we also query the need for trimester-specific ferritin thresholds for more accurate diagnosis of iron status.

Bridging Climate Knowledge Gaps for Resilient Farming Systems in Nigeria

Maryjane C. Onyechesi (1) and Monday R. Eguaoje (2)

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2. Agricultural Extension, Faculty of Agriculture, University of Nigeria, Nsukka, Enugu State, Nigeria, 410001

Climate change adaptation in agricultural systems depends on farmers' access to relevant and actionable climate information; however, gaps between information production and on-farm use persist across both Global South and Global North contexts. The objective of this study was to assess the climate change information needs, sources, and access constraints of smallholder farmers in Nnewi-North Local Government Area, Anambra State, Nigeria, and to consider their broader relevance for land and water management systems. Structured interviews were conducted with 70 farmers using a multistage sampling approach, and data were analysed using descriptive statistics and multiple linear regression. Farmers reported high information needs related to pest impacts on cropping systems ($M = 3.57$), climate adaptation technologies ($M = 3.52$), drought-resistant crop varieties ($M = 3.50$), and seasonal variability ($M = 3.50$). Climate information was obtained primarily through informal networks and radio, while formal extension services were rarely accessed. Limited extension capacity and technically complex messaging were identified as major constraints. Socio-economic characteristics were not significantly associated with information needs. Overall, the findings highlight challenges in translating climate knowledge into locally usable information and underscore the importance of user-centred communication strategies that are relevant to climate-resilient land and water management in diverse agricultural contexts.

ORAL PRESENTATION - SESSION 4

Louvain-Derived Dietary Communities and Their Associations with All-Cause Mortality and CVD Risk in Canadian Adults

Yifei Wang (1), Mahsa Jessri (1,2)

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Poor diet quality is a major modifiable risk factor for chronic disease, yet conventional methods have limited ability to capture direct food-food relationships. This study aimed to apply network analysis to identify dietary communities among Canadian adults and examine associations with all-cause mortality and cardiovascular disease (CVD) risk. Dietary intake (24-hour recalls) was obtained from Canadian Community Health Survey-Nutrition 2004 (n = 15,835; linked to health administrative databases). We used semiparametric Gaussian copula graphical models to construct dietary network and Louvain algorithm for community detection. Individual-level community scores were calculated and related to mortality and CVD using multivariable-adjusted Cox models. Three dietary communities were identified: Vegetable-Rich (VR), High-Sugary Beverage and Low Fruit (HSBLF), and High-Fat Breakfast (HFB). Higher VR scores were associated with lower mortality (HR: 0.49; 95%CI: 0.36-0.67), in both females (HR: 0.41; 95%CI: 0.26-0.63) and males (HR: 0.52; 95%CI: 0.33-0.81), and with lower CVD risk (HR: 0.55; 95% CI: 0.32-0.94). Higher HSBLF scores were associated with increased mortality overall (HR: 1.31; 95%CI: 1.06-1.62) and in males (HR: 1.39; 95%CI: 1.03-1.88). Overall, network analysis identified dietary communities associated with mortality and CVD, which may support precision nutrition by revealing dietary structure and informing targeted guidance for chronic disease prevention.

Sources of support: This research was supported by the Canadian Institute for Health Research (CIHR) and the Canada Research Chair Program (M.J.)

ORAL PRESENTATION - SESSION 4

Trapping and Detecting of Emerging Contaminant PFAS Using Novel Metal-Phenolic Networks-Enabled SERS Techniques

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Per- and polyfluoroalkyl substances (PFAS) are emerging contaminants that pose significant risks to human health. Conventional detection methods, such as liquid chromatography-mass spectrometry, offer high selectivity but are costly and lack portability, motivating the development of affordable and rapid screening approaches. Here, we present a metal-phenolic network (MPN)-enabled surface-enhanced Raman spectroscopy (SERS) platform integrated with machine learning (ML) for trapping and quantitative analysis of PFAS. MPNs formed by coordination between Zr^{4+} and tannic acid were self-assembled onto SERS substrates (e.g., silver nanoparticles) and filter membranes, creating interfaces that enrich PFAS and enhance SERS signals. To further enhance capture efficiency, metal-organic frameworks (e.g., ZIF-8), porous materials consisting of metal centers coordinated to organic ligands, were coated onto MPNs via Zr^{4+} -O coordination and hydrophobic/ π interactions. MPNs@AgNPs, ZIF-8@MPNs@AgNPs, and ZIF-8@MPNs@nylon membrane were prepared and evaluated. ML-based full-spectrum SERS analysis using PLSR, Random Forest, and XGBoost models achieved lower detection limits and significantly improved reproducibility compared with conventional single-peak SERS analysis. Limits of detection were derived from model-predicted statistics, and ZIF-8@MPNs@AgNPs outperformed MPNs@AgNPs. Additionally, ZIF-8@MPNs@nylon membranes enabled >90% PFAS removal via syringe filtration. This research provides a versatile, low-cost, and field-ready framework for PFAS detection and control.

From Seizure to Shelter: The Impact of Cruelty Cases on Animal Protection Officers' and Animal Shelter Workers' Mental Wellbeing

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In Canada, animal protection officers (APOs) and animal shelter workers (ASWs) are routinely exposed to animal cruelty, placing both groups at risk of poor mental health; however, the stressors contributing to this risk remain underexplored. This qualitative study examined how involvement in animal cruelty cases affects the mental health of APOs and ASWs and what support they need. Semi-structured interviews were conducted with 13 current and former APOs and ASWs from BC. Reflecting on their most impactful cruelty case, participants described the stressors and emotional impact experienced. Inductive thematic analysis identified role-specific and shared stressors. APO-specific stressors included being understaffed and being exposed to physical danger, whereas ASWs described challenges related to caring for difficult animals and prolonged court processes. Both groups identified witnessing animal cruelty and experiencing verbal abuse from the public as stressors. Although participants from both roles expressed a desire for more mental health support, APOs emphasized internal organizational changes, while ASWs underscored the need for external, systemic improvements. These findings highlight the distinct and shared challenges faced by APOs and ASWs and suggest avenues for change to support worker wellbeing, ultimately improving animal welfare, reducing employee turnover, and benefiting the broader community.

Supported by 'Canada Graduate Scholarships – Master's (CGS M) program' Social Sciences and Humanities Research Council (SSHRC)

ABSTRACTS

POSTER PRESENTATIONS



POSTER PRESENTATION - 1

The Bridge from Human to Animal Welfare

Asmi Aggarwal, Daniel M. Weary

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Much research has addressed 'human welfare' from the perspective of economics (How much does a country's economy affect an individual's welfare?), psychology (psychometric assessments to assess welfare), biology (what roles do genetics play?) and behavioural sciences, but it is unclear how these conceptions apply to animal welfare. I conducted a review of the scholarly literature with three aims: 1) describe key metrics used to assess human welfare, with a special focus on psychometric surveys and questionnaires used to operationalize human wellbeing, 2) critically assess if and how these constructs might be used to assess animal wellbeing, and 3) compare these approaches with the dominant approaches currently used in the scientific assessment of animal welfare. Analysis is ongoing, but one early result is that the experience of positive affective states (like happiness or joy) are often referenced in the human literature, but rarely applied in studies of animal welfare. It can lead to the development of a validated scale for measuring animal welfare, by starting off with the necessary constructs and borrowing ideas from human welfare literature. The results of this review will help identify how conceptions of human wellbeing can be used to inform methods for assessing animal welfare.

Source of Funding: N/A

POSTER PRESENTATION - 2

Understanding the Motivations of Feral Rabbit Feeding in British Columbia

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European rabbits (*Oryctolagus cuniculus*) have established free-living populations in British Columbia as a result of illegal pet abandonment. These populations are considered feral, meaning they are domesticated animals that have escaped captivity and live independently of humans. These rabbits can negatively impact local ecosystems, through overgrazing of plants, and increased competition with native species. Although feeding feral rabbits is illegal in British Columbia, resulting in fines, this activity continues to be popular among visitors of Jericho Beach. This study aimed to investigate the motivation behind feeding feral rabbits by surveying visitors at Jericho Beach, who were observed interacting with rabbits. The expected data will describe the demographic information of participants, their reason for visiting, and the type of interaction they had with the rabbits. We predicted that participants who fed rabbits would say they were unlikely to visit the Bunny Café, which offers a legal opportunity to feed rabbits. The findings of this study can be used to provide a clearer understanding of the motivations behind wildlife feeding, offering insights into how alternative opportunities for human-animal interactions could fulfill these motivations, reduce potential human-wildlife conflicts, and minimize the ecological impacts associated with these feral rabbit populations in British Columbia.

POSTER PRESENTATION - 3

Correlation Between the Number of Ovulations and the Number of Estrous Events Detected by an Automated Activity Monitor in Lactating Holstein Cows

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Sustaining milk production in dairy herds requires timely conception following calving. Automated activity monitors (AAM) show potential to identify breeding periods based on activity patterns; however, their effectiveness may be influenced by postpartum reproductive physiology. This study aimed to evaluate the association between the number of ovulations and the number of estrous events detected by an AAM in postpartum lactating Holstein cows. Eighty-two cows were monitored from 14 to 56 days in milk (DIM). Estrous events were recorded using a neck-mounted AAM system, and ovulation was assessed by transrectal ultrasonography. Associations were assessed using Pearson correlation coefficients and Poisson regression models. Between 14 and 35 DIM, 75.6% of cows exhibited at least one ovulation event, increasing to 91.4% by 56 DIM. Correspondingly, 58.6% of cows exhibited at least one estrous event between 14 and 35 DIM, increasing to 80.5% by 56 DIM. The number of ovulations was moderately correlated with the number of estrous events during the study period ($r = 0.40$ for 14-35 DIM; $r = 0.45$ for 35-56 DIM; $r = 0.50$ by 56 DIM). Our findings suggest that AAM shows promise in reflecting postpartum ovarian activity, although further optimization is still needed.

Role of the N-terminal Domain in CsgA Amyloid Assembly

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In *Escherichia coli*, a major structural component of biofilms is curli, a class of stable, ordered protein aggregates known as functional amyloids that provide mechanical stability and resistance to chemical and physical stresses. Curli fibers constitute approximately 85% of the extracellular matrix in curli-associated biofilms. Their biogenesis is governed by the *csgBAC* and *csgDEFG* operons, with CsgA as the main structural subunit. Monomeric CsgA is an intrinsically disordered protein composed of five repeat domains (R1–R5), which form the amyloid core, and an N-terminal domain (N22) whose structural role remains unclear. Despite extensive research, questions remain regarding the molecular interactions occurring during early CsgA aggregation and fibril formation. To investigate the role of N22, CsgA wild-type (WT), CsgA without the N22 (Δ N22), and the accessory proteins CsgB and CsgC were recombinantly expressed in the same *E. coli* system and purified by FPLC. Aggregation kinetics were monitored using Thioflavin T fluorescence. Removal of N22 accelerated fibril formation, with Δ N22 exhibiting a shorter lag phase (12 h) compared to WT (25 h). These results indicate that N22 modulates early nucleation events and influences amyloid assembly dynamics. Further studies will compare Δ N22 and full-length CsgA using complementary ensemble and single-molecule biophysical techniques.

POSTER PRESENTATION - 5

Dietary Leucine Requirements During Early and Late Gestation in Healthy Pregnant Women

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Maternal nutrition is a key modifiable factor influencing fetal growth, yet current recommendations may not reflect true physiological demands of pregnancy. Stable isotope studies show increased protein turnover early in gestation and increased protein synthesis across pregnancy. Although current Dietary Reference Intake (DRI) recommends 1.1 g/kg/day of protein, Indicator Amino Acid Oxidation (IAAO) evidence suggests needs in early and late pregnancy are 30% to 40% higher. DRIs for indispensable amino acids are based on factorial calculations, and our laboratory has identified pregnancy-specific requirements for several amino acids that differ from these estimates. Leucine, a key amino acid, requirements during pregnancy remain undefined. Current recommendations of 45 mg/kg/day are extrapolated from nonpregnant male data and may not capture pregnancy-specific metabolic adaptations. Leucine regulates muscle protein synthesis through activation of the mTORC1 pathway and supports fetal growth, yet both low and high intakes are associated with adverse effects. The objectives of this study are to determine leucine requirements in early and late gestation using the IAAO method and to examine plasma amino acids, leucine metabolites, and pregnancy hormones in response to graded leucine intakes. This minimally invasive repeated-measures study will provide evidence to refine amino acid recommendations and improve maternal nutrition guidance.

Supported by CIHR PG - Indispensable amino acid requirements in pregnancy and lactation

POSTER PRESENTATION - 6

Habitual Energy and Protein Intakes in Male and Female Masters Athletes: A Multilevel Meta-Analysis

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Athlete nutrition is an essential consideration for health and performance. However, we know surprisingly little about the dietary practices of master athletes (MA), particularly women.

We conducted a multilevel meta-analysis to characterize relative daily energy and protein intake in MA, and examine whether intake was modified by sex (% women in sample). We identified 21 studies (n=2878 total participants, n=1395 women) quantifying habitual energy and macronutrient intake in active individuals with a mean age ≥ 35 years. Multilevel random-effects meta-analyses were fit to estimate outcome means and 95% confidence intervals using restricted maximum likelihood, with random effects for study and nested group/timepoint clusters to account for repeated-measures. Meta-regression models were used to examine the impact of sex.

Pooled daily energy intake was 32.08 [29.26, 34.90] kcal·kg⁻¹, with athletes consuming 1.65 [1.43, 1.88] g·kg⁻¹ of protein/day. A higher proportion of women in a cohort was associated with greater relative protein consumption (+0.29 [0.04, 0.53] g·kg⁻¹; p=0.024) and a trend for greater relative energy intake (+4.56 [-0.28, 9.41] kcal·kg⁻¹; p=0.065). Male and female MA consume approximately twice the current recommended daily allowance of protein.

Supported by the Dean Warren D Kitts Scholarship, NSERC Discovery Grant, and ELCHA Undergraduate Research Student Scholarship

POSTER PRESENTATION - 7

PREconception Folic Acid Clinical Efficacy (PREFACE) Trial

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Folic acid supplementation is recommended from preconception until the end of lactation for protection against fetal neural tube defects (NTDs) and to support infant growth and development. However, another form of supplemental folate, 5-MTHF, is also approved by Health Canada and is increasingly being used by those who are pregnant and trying to conceive. It is unclear whether these folate forms should be considered interchangeable, as they have different chemical structures and are metabolized differently. To address this gap, we are planning a multi-site randomized controlled trial in Vancouver, BC and Saskatoon, SK to determine whether supplementation starting preconceptionally with 5-MTHF is at least as effective as folic acid in increasing maternal folate status for protection against NTDs. Our primary aim is to measure maternal RBC folate concentrations (nmol/L) at 6(\pm 2) weeks gestation, the approximate time of neural tube closure. Individuals who are trying to become pregnant (n=136 per arm) will be randomized to supplementation with folic acid or 5-MTHF; supplementation will continue until ~1 month postpartum. Blood folate levels will be assessed at preconception and 6(\pm 2) weeks gestation and measured using microbial assay. Our results will help to confirm the safety and effectiveness of prenatal supplements containing 5-MTHF.

Supported by Canadian Institutes of Health Research (2023 Project Grant)

POSTER PRESENTATION - 8

Capturing (Dis)Placed Filipino Foodways on Coast Salish Lands

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Foodways from the Philippines are diverse and rich, spanning numerous ethnic groups and islands in the archipelago nation and in the diaspora. Foodways provide connection between familial, non-familial, and spiritual relations while maintaining an important role in the intergenerational continuation of Filipino culture (Mangompit, 2024). Foodways are carried over to Metro Vancouver (MV) by Pilipinx migrants and their descendants who number 142,125, and are the third largest visible minority in the region (Statistics Canada, 2024). Many Filipinos in Canada face adversity in the face of global mass migration for export (Rodriguez, 2010), which is facilitated by Philippine and Canadian policy. Adverse experiences include higher rates of food insecurity, precarious labour employment, and lack of culturally relevant socio-political support from governments (Castro-Palaganas et al., 2017; Asuncion et al., 2022; Heckelman & Wittman, 2015). Through community based participatory methodology, this emergent research will work with Pilipinx research participants to identify how the Filipino community in MV practice Filipino foodways to “perform old and new senses of home, celebration of tradition, and connection with kin and community within new and even hostile spaces” such as so-called Canada (Agyeman and Giacalone, 2020, p. 7). This emergent research aims to use photovoice and “anticolonial storytelling [to] remake the world” (Vasudevan, Ramirez, & Daigle, 2022, p. 10) as an approach to understanding how Filipino food sovereignty has supported Pilipinx migrants, their descendants, and allies living in the MV region.

Supported by SSHRC Canada Graduate Scholarship Master's Award, Faculty of Land and Food Systems Graduate Award, ACRE Graduate Student Award, and the Mary and David Macaree Fellowship

Tailored Deep Learning-Assisted In Situ SERS: Overcoming Surface Irregularities-Induced Large Signal Variation on Biological Tissues

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Accurate in situ quantification on biological tissues with uneven surfaces using surface-enhanced Raman spectroscopy (SERS) remains a persistent challenge due to severe signal variability arising from surface irregularities and the coffee-ring effect. Herein, we present a tailored deep-learning-assisted in situ SERS strategy that integrates minimal sample preparation, a low-cost SERS substrate, and a tailored one-dimensional convolutional neural network (1D-CNN) for highly reproducible SERS quantification on uneven biological surfaces. Detection of thiabendazole on apple skin served as a representative model. We highlight the critical role of sample preparation and SERS substrate selection in minimizing spectral variation. To address the remaining substantial intensity variability after preprocessing, a tailored 1D-CNN with decreasing kernel sizes (57-37-11-3) was compared with single-peak intensity calibration (SPIC), partial least squares regression, random forest, and fixed-kernel 1D-CNNs (3 and 5). The tailored 1D-CNN consistently outperformed all other models, improving the R^2 for AuNPs-enhanced thiabendazole quantification from 0.332 (SPIC) to 0.935 while maintaining a short training time of 242 s. This work establishes a generalizable deep-learning-enabled framework for mitigating surface-induced signal variability in in situ SERS, allowing accurate quantification of complex biological tissues and advancing the practical deployment of SERS for real-world sensing applications.

Molecular Effects of Polyphenols from Different Kombucha Fermentation Products in HepG2 Liver Cells

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Kombucha is a beverage made by fermenting sweetened tea with a symbiotic culture of bacteria and yeast. It contains a variety of bioactive compounds, including polyphenols, that may play a role in mitigating oxidative stress, which is implicated in several liver diseases, including metabolic dysfunction-associated steatotic liver disease. Previous studies suggest that kombucha may have protective effects against liver lipid accumulation and disrupted homeostasis. This study aimed to investigate how polyphenolic compounds from different kombucha fermentation products affect gene expression and cell growth in HepG2 liver cells. Cells were treated with polyphenolic extracts from different kombucha fermentation mixtures, then counted and analyzed for expression of genes related to liver function. Polyphenolic extracts from kombucha fermented with white gooseberry juice and green tea had the most potent effects on cell growth and were chosen for gene expression experiments. Kombucha extracts, particularly with green tea, were found to promote a transcriptomic profile of homeostasis in the liver, specifically impacting regulation of genes involved in glucose metabolism (G6PC), lipid accumulation (FABP4), one-carbon metabolism (ALDH1L1), and oncogenic signaling pathways (WNT10B, EPCAM and SERPINE1). Our findings support a potential role of kombucha phenolic extracts in the regulation of liver function and prevention of liver disease.

Udder Health: Associating Automated Measurements with Mastitis Events in Lactating Holstein Cows

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Mastitis, the inflammation of the mammary gland, is among the most common diseases in dairy cattle that results in major economic losses and reduced animal welfare. The widespread adoption of automated milking systems (AMS) and wearable sensors has generated valuable data for monitoring cattle health events, however their reliability for mastitis detection remains insufficiently established. This study aims to evaluate the association between AMS and sensor measurements and mastitis events in lactating Holstein cows. Animals are enrolled at calving and monitored through 100 days in milk (DIM). Wearable sensors record daily rumination and eating time, while AMS provides daily milk yield, temperature and conductivity. Cows are evaluated every three days from 0-30 DIM, then every seven days from 30-100 DIM, for visual characteristics of the udder (e.g. signs of edema, udder and teat conformation), milk appearance (e.g. colour and consistency) and for subclinical mastitis using the California Mastitis Test (CMT). Correlations between AMS and sensor data with visual measurements will be analyzed to identify patterns that can aid in the detection and prediction of mastitis events in AMS cows. We hypothesize that the integration of automated measurements may support mastitis identification and contribute to improved animal welfare on dairy farms.

Protein Requirements in Highly Active Older Adults and the Influence of Exercise

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Canada's population is aging rapidly. Recent projections indicate that one quarter of Canada's population will be ≥ 65 years by 2030. Older individuals are more likely to experience anabolic resistance, a condition where muscle-building processes are impaired in response to protein intake and exercise, and this accelerates the loss of skeletal muscle, increasing the risk of hospitalization, falls, and fractures. Protein nutrition and exercise training are well-known approaches for promoting muscle growth and preventing muscle loss across populations. Despite the presence of anabolic resistance, protein guidelines do not differ between younger and older individuals, nor do they consider very highly physically active older adults. Master athletes are a unique population of older individuals who have maintained exercise habits later in life, providing useful insights into how exercise may protect against this inevitable age-related decline. I aim to use gold standard stable isotope approaches to 1) characterize protein requirements in healthy sedentary older adults and master athlete older adults, and 2) determine how chronic exercise training may play a role in altering these protein requirements. We anticipate that this work will contribute to guidelines to protect against age-related muscle loss, ultimately improving quality of life and functional independence.

Perinatal Lifestyle Interventions for Managing Postpartum Weight and Glucose Outcomes: A Systematic Review and Meta-Analysis

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Weight retention and impaired glucose regulation during the postpartum period are significant predictors of long-term metabolic dysfunction. However, clinical attention in postpartum period is focused on offspring health, leaving post-partum individuals with little support to reduce risk. To address this gap, we systematically collated all available evidence from randomized controlled trials in humans that reported on the association between perinatal dietary pattern and maternal weight or glycaemic outcomes. Across five databases, 64 studies were identified, of which 19 provided quantitative data suitable for meta-analysis. Studies included participants of Asian and Caucasian ethnicity and were conducted across North America, Asia, and Europe. Healthy interventions over the perinatal period are associated with lower weight-related metrics, compared to controls. However, beneficial effects were confined to gestational weight gain (MD: -1.17 kg, 95% CI: -1.95, -0.39; 8 studies), with no significant effect observed for postpartum weight retention (MD: -0.61 kg, 95% CI: -1.94, 0.71; 7 studies). For glycaemic outcomes, pooled analyses (3 studies) showed no significant effects of perinatal lifestyle interventions on fasting plasma glucose or 2-hour postprandial glucose. Overall, perinatal interventions appear to modify pregnancy-related weight trajectories, but heterogeneity in study design and limited intervention intensity constrain evidence for sustained postpartum metabolic benefits.

Methylo-trophic Methanogenesis in the Rumen: The Role of Pectin Metabolism during 3-NOP Supplementation in Cattle

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Methane produced by microorganisms in the cow's rumen- or fermentative stomach- is a major contributor to greenhouse gas emissions. Most methane-reduction strategies, like the feed additive 3-nitrooxypropanol (3-NOP), focus on inhibiting hydrogen-dependent methanogenesis. However, some methylo-trophic methanogens use an alternative pathway relying on methanol and methylamines derived from dietary pectin, choline, and betaine. How this pathway responds to 3-NOP supplementation remains poorly understood. This study examined how pectin metabolism could influence methanol availability and methane production in cattle, and whether it could be modified by 3-NOP supplementation. Metagenomic analyses determined which rumen microbes carry genes involved in pectin degradation and methylo-trophic methanogenesis across different production systems and under 3-NOP treatments. Targeted metabolite measurements quantified methanol, methylamines, and volatile fatty acids. Finally, transcriptional profiling confirmed which key methanogenesis genes altered expression under 3-NOP supplementation. We expect increased pectin metabolism to elevate methanol availability, allowing methylo-trophic methanogens to contribute residual methane production under 3-NOP treatment. Partial inhibition of methanogenesis is also expected to redirect hydrogen toward propionate and butyrate formation. By linking pectin degradation, microbial genes, metabolites, and fermentation outcomes, this research addresses a critical gap in methane mitigation strategies and supports more effective approaches for reducing emissions from cattle production systems.

This work was funded by the Beef Cattle Research Council Cluster (FDE.18.21C), Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery and NSERC Alliance program (ALLRP 588541-23), Foundation for Food & Agriculture Research Greener Cattle Initiative (Award ID 22-000373), and DSM Nutritional Products, Kaiseraugst, Switzerland.

Formulation of Broad-Spectrum Bacteriophage Cocktails for Controlling Poultry-Associated Salmonella Enteritidis

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Salmonella is a Gram-negative zoonotic pathogen that poses a major threat to food safety, with eggs and egg products being one of the primary transmission sources. Current egg sanitation practices rely on chemical antimicrobials, which raise concerns regarding residues, limited antimicrobial efficacy, and carcinogenic byproducts. As a targeted and sustainable alternative, bacteriophages (phages) show promise for controlling Salmonella in poultry production. This study aims to evaluate the lytic activity of phages against poultry-associated Salmonella. Several phage-host combinations showed significant titer increases ($p < 0.05$), indicating strong lytic activity, and most of them exhibited similar latent periods (~10 min). Phage 6 demonstrated the broadest host range (5/7 strains), followed by Phage 5 (3/7), while Phages 1, 3, and 4 each lysed a single strain. Phage 6 had the largest burst size (2,638 PFU/cell), followed by Phage 4 (1,349 PFU/cell) and Phage 5 (522 PFU/cell). Based on host range and replication characteristics, Phages 4, 5, and 6 were formulated into seven individual or combined phage cocktails. Overall, these phages demonstrate strong potential for Salmonella reduction, supporting phage cocktails as a targeted and sustainable alternative to chemical sanitizers for egg safety management.

Adolescents' Perspectives and Experiences with Dietary Mobile Health Apps: A Scoping Review

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Numerous studies have examined the impact of dietary mobile health (mHealth) apps for influencing dietary habits in adolescents, though few investigated adolescents' perspectives and experiences with these tools. This scoping review aimed to synthesize the evidence and map the research gaps on adolescents' perspectives and experiences of using dietary mHealth apps. Mixed-methods studies published from 2013-2023 that focused on adolescents (10-19 years old) reporting perspectives (positive or negative) and experiences (attitudes, barriers, and facilitators) related to dietary apps use were searched across: PsycINFO, Embase, Medline, Web of Science and CINAHL. Of the 590 abstracts screened, 17 studies met the eligibility criteria. Thematic analysis revealed seven overarching themes: (1) Technical Functionality and Usability; (2) Appreciation of Nutritional Education and Content Depth; (3) Importance of Social Connection, Feedback and Support; (4) Values of Entertainment and Gamification; (5) Significance of Personal Goals, Motivation and Tracking; (6) Interest for Simple Design and Interface; and (7) Perceived Effectiveness of Dietary mHealth Apps. Overall, adolescents' engagement with dietary mHealth apps are enhanced by technical functionality, usability, social engagement, personalization, and gamification, although barriers such as tracking inaccuracies, technical issues, and limited social interaction reduce app effectiveness. These are critical understandings for app design for adolescent users.

Leveraging Decision Support Systems for Agroecology in Ekiti State, Nigeria

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Traditional farming methods, a lack of access to data-driven decision support systems (DSS), and insufficient use of sustainable agroecological methods have limited agricultural productivity in Nigeria. This research study investigates how DSS technologies can improve agroecology among smallholder farmers in Ekiti State, Nigeria. The research took a mixed-method approach, utilizing quantitative data from 100 farmers within two local government areas and qualitative interviews with extension agents and researchers. Results showed that 55% of farmers had limited knowledge about DSS and 69% indicated willingness to transition into agroecological farming using DSS. Chi-square analysis showed significant relationships between knowledge level ($\chi^2=13.101, p=0.011$) and attitude ($\chi^2=16.444, p=0.002$), and adoption willingness. 18% had previously used DSS technologies and an additional 82% of farmers indicated no DSS training or agroecological practices in three years. The study showed barriers to DSS tools as a lack of digital knowledge, insufficient training, and little knowledge of specific DSS applications. Despite these barriers, the results indicate that if extension services are strengthened through training programs focused on farmer needs, then it is likely that more smallholders will adopt DSS technologies to help with their transition to agroecological farming to improve soil health, increase resource efficiency, and adapt to climate change.

Micronutrient Deficiencies among Pregnant Individuals in Cambodia: Prevalence Rates and Trends Across Trimesters

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Pregnant individuals receive iron and folic acid (IFA) in Cambodia. However, other essential micronutrients are often overlooked. Non-fasting blood samples were collected from 90 pregnant women receiving IFA. Biomarkers for folate, vitamin B12 and thiamine were measured using standardised laboratory methods.

The mean \pm SD age of participants was 26.3 \pm 5.0 years, and 94% reported consuming IFA tablets during pregnancy. The median (IQR) concentrations for folate were 21.3 (13.6, 30.9) nmol/L, for vitamin B12 were 255.5 (177.3, 342.9) pmol/L, and for thiamine were 156 (128.8, 197.3) nmol/L. Overall, there was no biochemical prevalence of folate deficiency (<6.8 nmol/L); 23% of individuals had low folate status (6.8-13.4 nmol/L). Across the first, second, and third trimesters, the prevalence of low folate status was 14%, 7%, and 41%. Overall, the prevalence of vitamin B12 deficiency (<149 pmol/L) was 13%, with variation across trimesters. Prevalence of thiamine deficiency (<120 nmol/L) and marginal thiamine deficiency (120-150 nmol/L) was 14% and 31%. Across the first, second, and third trimesters, the prevalence of thiamine deficiency was 0%, 7%, and 26%.

IFA alone may not be sufficient for pregnant individuals. More research is needed to determine whether multiple micronutrient supplements, containing 15 essential micronutrients, would improve maternal and infant health outcomes.

Revitalizing Forest Gardens in Łaxyuubm Ts'msyen: Historical Indigenous Land-Use for Contemporary Soil Resilience

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Soils, along with the ecosystems they sustain, bear the signatures of historical land-use and offer insights into circular and resilient food systems. Indigenous forest gardens exemplify how millennia of land stewardship in the Pacific Northwest, such as burning and fish fertilization, resulted in biodiverse, multi-functional, and food-rich ecosystems supported by soils enriched in carbon and bioavailable nutrients.

In collaboration with the Gitselasu First Nation community garden, this research integrates traditional soil-forming practices identified in the ancient Gitsaex forest garden with the development of a culturally relevant composting system that uses salmon remains and charcoal to support Gitselasu land and food sovereignty. During fishing season, community members will dispose of fish remains in newly built compost bays, which will be mixed with biochar (a charcoal soil amendment) and woodchips, then used to amend a community forest garden in a way that honours traditional soil stewardship.

This community-based research will be supported by a growth chamber experiment to (1) determine a salmon-biochar compost application rate that maximizes nutrient-use efficiency of a typical forest garden species, stinging nettle (*Urtica dioica*), and (2) investigate the co-composting process of biochar and salmon, comparing the resulting properties to traditional Gitsaex forest garden soils.

Antimicrobial Peptide Residue Detection in Chicken Breast Muscle Tissue

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Antibiotic resistance is an emerging global health threat with serious implications for public health. As the most-consumed meat in Canada, chicken is particularly concerning because consumers may be indirectly exposed to antibiotics used as veterinary medicine. Thus, identifying effective alternatives to antibiotics is crucial for sustainability in the agri-food sector. Antimicrobial peptides are promising alternatives to antibiotics for poultry production. However, reliable residue detection methods to ensure low peptide residual levels and prevent unintended exposure impacting human health remain limited. This study aims to develop a standardized spiking protocol to validate analytical procedures for peptide residue detection in chicken breast muscle. Nisin (1 mM in 0.1% trifluoroacetic acid) was spiked at four critical stages of the detection procedure, including tissue homogenization, acetone precipitation, acid-based extraction, and C18 spin-tip cleanup. Nisin detection was performed using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. Nisin was not detected in the first three extraction steps, as no characteristic peaks appeared in the mass spectra. Detection occurred only in the samples obtained from C18 spin-tip cleanup step. The high NaCl levels in commercial nisin hindered the analysis. Further experiments will focus on detecting nisin residues in chicken muscle using microbial plate counting.

Effects of Dietary Pterostilbene on Subcellular Distribution of Metabolites Involved in Epigenetic Regulation in Liver Tissue

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The liver is central to metabolic regulation but is highly susceptible to damage from environmental and dietary factors. Dysregulated hepatic metabolism has been linked to the development and progression of liver diseases such as hepatic steatosis and hepatocellular carcinoma (HCC). During hepatic metabolism, key intermediate molecules that support energy production and metabolic signalling, called metabolites, are produced. Previous studies have connected these metabolites to cellular regulation and gene expression and have demonstrated protective effects of dietary polyphenols against dysregulated hepatic homeostasis. This study aimed to identify changes in subcellular compartmentalization of metabolites involved in epigenetic regulation following dietary polyphenol pterostilbene (PTS) supplementation. Rats were fed a control diet (D-CON) or a choline-deficient diet known to induce HCC (D-HCC), with or without PTS supplementation. Nuclear and cytosolic fractions were isolated and analyzed using targeted LC-TQMS metabolomics. Relative to D-CON samples, D-HCC samples exhibited increased nuclear and cytosolic levels of several metabolites. D-HCC+PTS samples showed differences in nuclear metabolites from the one-carbon metabolism (OCM) pathway compared with D-HCC, including higher nuclear betaine levels and lower levels of S-adenosylhomocysteine (SAH) and cystathionine. These findings support a potential role for PTs in shaping the subcellular distribution of metabolites involved in hepatic epigenetic regulation.

POSTER PRESENTATION - 22

Assessing Knowledge of Evidence-Based Dog Training Among Pet Care Professionals in Greater Vancouver

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Pet owners frequently seek training advice from non-trainer pet professionals including dog walkers, groomers, pet sitters, and pet store employees, yet no research has examined these professionals' knowledge of evidence-based training methods. Dog training remains unregulated in Canada, creating risk for dissemination of practices that could compromise canine welfare. This study examined pet care professionals' knowledge of evidence-based training principles and referral practices to dog trainers. We predicted pet professionals would demonstrate variable knowledge across training topics and show low referral rates to dog trainers. Non-trainer pet professionals were recruited through direct outreach at pet service businesses across Greater Vancouver, targeting a sample of 50-75 participants. Participants completed a 15-minute online survey assessing their confidence addressing common behavioral issues, likelihood of recommending specific training equipment and methods, frequency of referring clients to training professionals, and knowledge of evidence-based training terminology. The data described demographic characteristics of these professionals providing training advice, their confidence in recommendations, and frequency of appropriate referrals to dog trainers. The findings from this study will identify specific knowledge gaps and inform targeted educational programs, directly supporting evidence-based policy development for animal welfare organizations in British Columbia.

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